Medium Range Power Supplies
Changes, Spares, and Test Power Supplies
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November 27, 2001

Summary

The initial medium range power supply order has 69 units grouped into 11 models. This order will modified due to:

- Correction of the ratings of the sextupole power supplies
- Changes in the ratings of three RTBT power supplies
- Spare units and spare component parts
- Test power supplies

My goal here is to look at each of these issues, and combine them such that only a single PCR will need to be written to accomplish all these requirements.

Sextupole Power Supplies

The table below describes the operating parameters for the large sextupoles:

Name	Magnet	# of Magnets	1.0 GeV I, Amps	1.3 GeV I, Amps	1.3 GeV x 1.1 I, Amps	Magnet R, mOhms
SV3_7	21S26	8	66.2	79.3	87.2	22.1
SH4	26S26	4	70.7	84.6	93.1	48.3
SV5	21S26	4	124.1	148.7	163.5	22.1
SH6	26S26	4	106.0	127.0	139.7	48.3

Name	Total Magnet V, Volts	Cable Size kcmil	Cable R µOhms/ft	Cable Length rt, feet	Total Cable V, Volts	Total Load V, Volts
SV3_7	15.4	262.0	53.4	1980	9.2	24.6
SH4	18.0	262.0	53.4	1754	8.7	26.7
SV5	14.5	262.0	53.4	1754	15.3	29.8
SH6	27.0	262.0	53.4	1754	13.1	40.1

The power supply to power all of these will be rated 200 Amps at 48 Volts.

RTBT Power Supplies

There are three changes to the RTBT power supply ratings:

- QH4 changes to 840 Amps, 48 Volts from 720 Amps, 90 Volts
- QV13 changes to 840 Amps, 48 Volts from 720 Amps, 90 Volts
- QH30 changes to 720 Amps, 90 Volts, from 1,440A, 90 Volts

Spare Units

Where quantities are large, spare units should be purchased. This is the case for:

- UD450A36V - 21 units required, 2 spare units recommended
- UD720A90V - 7 units required, 1 spare unit recommended
- UD840A48V - 8 units required, 1 spare unit recommended
- UD1440A90V - 9 units required, 1 spare unit recommended

For all other models, spare components should be purchased. These components include:

- Magnetics, including rectifier transformers and filter chokes
- Power Semiconductors, including SCRs and free wheeling diodes
- Other Power Elements, including contactors, fuses, and snubber boards.
- Current sensors, especially DCCT electronics
- Replacement boards, including Enerpro firing cards, regulation cards and monitoring boards
- Low level power supplies, such as +/- 15VDC and 5VDC

Test Power Supplies

Even though only two units are required for operation, an additional UD5040A18V has been requested to test main dipole magnets in the RATS building. It will also be available for a spare, if needed, so spare components for the UD5050A18V will not be needed if the test supply is purchased.

Quantity Changes by Model Number

The table on the next page lists the quantity changes previously mentioned, by model type. Those units that do not use a complete unit as a spare will have a parts cost of one third of the production cost estimated for spare parts.

The cost of the UD200A48V has been estimated as $18K for the first article, and $12K for each production unit. With this estimate, the change order will be for about $70K, of which $45K is the test unit.

	Quantities			Unit Cost (Production)	Complete Unit	Action	Spare Parts Cost
	Order	**Now**	**Change**				
UD200A48V	0	5	5	$12,000.00	$66,000.00	*Added:* Ring_PS:SV3_7, SH4, SV5, SH6, spare	
UD450A36V	21	23	2	$15,052.35	$30,104.70	Added: *Spare x 2*	
UD480A72V	3	3	0	$17,431.50	$ 0.00		$5,810.50
UD720A90V	11	8	-3	$23,273.90	-$69,821.70	*Added:* RTBT_PS:QH30, spare *Removed:* Ring_PS:SH4, SV5, SH6, RTBT_PS:QH4, QV13	
UD840A48V	6	9	3	$19,848.20	$59,544.60	*Added:* RTBT_PS:QH4, QV13, Spare	
UD1080A192V	4	3	-1	$33,501.33	-$33,501.33	*Removed:* Ring_PS:SV3_7	$11,167.11
UD1320A420V	6	6	0	$58,545.40	$ 0.00		$19,515.13
UD1440A90V	10	10	0	$29,602.11	$ 0.00	*Added:* Spare *Removed:* RTBT_PS:QH30	
UD2520A72V	2	2	0	$39,851.00	$ 0.00		$13,283.67
UD2640A18V	3	3	0	$29,219.00	$ 0.00		$9,739.67
UD3840A60V	1	1	0	$43,609.00	$ 0.00		$14,536.33
UD5040A18V	2	3	1	$44,659.00	$44,659.00	*Added:* Test Unit	
Totals $171,037.68	69	76	7		$96,985.27		$74,052.41